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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,719	06/04/2001	David E. Heckerman	MS158346.1	4954
27195 7590 08/08/2007 AMIN. TUROCY & CALVIN, LLP 24TH FLOOR, NATIONAL CITY CENTER 1900 EAST NINTH STREET CLEVELAND, OH 44114			EXAMINER STARKS, WILBERT L	
			ART UNIT 2129	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/873,719	Applicant(s) HECKERMAN, DAVID	
	Examiner Wilbert L. Starks, Jr.	Art Unit 2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-25,27-30,32-42,44-48,50-60 and 62-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-25,27-30,32-42,44-48,50-60 and 62-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 U.S.C. § 101

1. 35 U.S.C. §101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

the invention as disclosed in claims 1, 3-25, 27-30, 32-42, 44-48, 50-60, and 62-64 is directed to non-statutory subject matter.

2. Claims 1, 3-25, 27-30, 32-42, 44-48, 50-60, and 62-64 are not limited to practical applications. Specifically, Examiner finds that *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) controls the 35 U.S.C. §101 issues on that point for reasons made clear by the Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447 (Fed. Cir. 1999). Specifically, the Federal Circuit held that the act of:

...[T]aking several abstract ideas and manipulating them together adds nothing to the basic equation. *AT&T v. Excel* at 1453 quoting *In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir. 1994).

Examiner finds that Applicant's "computer readable data set" references are just such abstract ideas. True, had Applicant claimed a "computer readable medium," Applicant would have claimed a "product of manufacture" and would get "two bites at the apple," as it were, to have the claims analyzed as statutory (that is, based on the claim that it is

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a "product of manufacture" or based on the underlying method of the claim.) Such is not the case here...Applicant claims a "computer readable data set." As such, a computer readable data set is not computer program steps on a computer readable medium that causes the computer to do a specific thing...it is merely an abstract data set.

3. Examiner bases his position upon guidance provided by the Federal Circuit in *In re Warmerdam*, as interpreted by *AT&T v. Excel*. This set of precedents is within the same line of cases as the *Alappat-State Street Bank* decisions and is in complete agreement with those decisions. *Warmerdam* is consistent with *State Street's* holding that:

Today we hold that *the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price*, constitutes a practical application of a mathematical algorithm, formula, or calculation because it produces 'a useful, concrete and tangible result' -- *a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.* (emphasis added) *State Street Bank* at 1601.

4. True enough, that case later eliminated the "business method exception" in order to show that business methods were not per se nonstatutory, but the court clearly *did not* go so far as to make business methods *per se statutory*. A plain reading of the excerpt above shows that the Court was *very specific* in its definition of the new *practical application*. It would have been much easier for the court to say that "business methods were per se statutory" than it was to define the practical application in the case as "...the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price..."

5. The court was being very specific.
6. Additionally, the court was also careful to specify that the “useful, concrete and tangible result” it found was “a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.” (i.e. the trading activity is the further practical use of the real world monetary data beyond the transformation in the computer – i.e., “post-processing activity”.)
7. Applicant cites no such specific results to define a useful, concrete and tangible result. Neither does Applicant specify the associated practical application with the kind of specificity the Federal Circuit used.
8. Furthermore, in the case *In re Warmerdam*, the Federal Circuit held that:

...[T]he dispositive issue for assessing compliance with Section 101 in this case is whether the claim is for a process that goes beyond simply manipulating 'abstract ideas' or 'natural phenomena' ... As the Supreme Court has made clear, '[a]n idea of itself is not patentable, ... taking several abstract ideas and manipulating them together adds nothing to the basic equation'. In re Warmerdam 31 USPQ2d at 1759 (emphasis added).

9. Since the Federal Circuit held in *Warmerdam* that this is the “dispositive issue” when it judged the usefulness, concreteness, and tangibility of the claim limitations in that case, Examiner in the present case views this holding as the dispositive issue for determining whether a claim is “useful, concrete, and tangible” in similar cases.

Accordingly, the Examiner finds that Applicant manipulated a set of abstract “computer readable data sets” to solve purely algorithmic problems in the abstract (i.e., what *kind* of “data” is used? Algebraic word problems? Boolean logic problems? Fuzzy logic algorithms? Probabilistic word problems? Philosophical ideas? Even vague expressions, about which even reasonable persons could differ as to their meaning? Combinations thereof?) Clearly, a claim for algorithmic manipulation of “computer readable data sets” is provably even more abstract (and thereby less limited in practical application) than pure “mathematical algorithms” which the Supreme Court has held are per se nonstatutory – in fact, it *includes* the expression of nonstatutory mathematical algorithms.

10. Since the claims are not limited to exclude such abstractions, the broadest reasonable interpretation of the claim limitations includes such abstractions. Therefore, the claims are impermissibly abstract under 35 U.S.C. §101 doctrine.

11. Since *Warmerdam* is within the *Alappat-State Street Bank* line of cases, it takes the same view of “useful, concrete, and tangible” the Federal Circuit applied in *State Street Bank*. Therefore, under *State Street Bank*, this could not be a “useful, concrete and tangible result”. There is only algorithmic manipulation of abstract ideas.

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12. The Federal Circuit validated the use of *Warmerdam* in its more recent *AT&T Corp. v. Excel Communications, Inc.* decision. The Court reminded us that:

Finally, the decision in *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) is not to the contrary. *** The court found that the claimed process did nothing more than manipulate basic mathematical constructs and concluded that 'taking several abstract ideas and manipulating them together adds nothing to the basic equation'; hence, the court held that the claims were properly rejected under §101 ... Whether one agrees with the court's conclusion on the facts, the holding of the case is a straightforward application of the basic principle that mere laws of nature, natural phenomena, and abstract ideas are not within the categories of inventions or discoveries that may be patented under §101. (emphasis added) *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447, 1453 (Fed. Cir. 1999).

13. Remember that in *In re Warmerdam*, the Court said that this was the dispositive issue to be considered. In the *AT&T* decision cited above, the Court reaffirms that this is the issue for assessing the “useful, concrete, and tangible” nature of a set of claims under §101 doctrine. Accordingly, Examiner views the *Warmerdam* holding as the dispositive issue in this analogous case.

14. The fact that the invention is merely the manipulation of *abstract ideas* is clear. The data referred to by Applicant's phrase “computer readable data set” is simply an abstract construct that does not limit the claims to the transformation of real world data (such as monetary data or heart rhythm data) by some disclosed process. Consequently, the necessary conclusion under *AT&T*, *State Street* and *Warmerdam*, is straightforward and clear. The claims take several abstract ideas (i.e., “computer readable data sets” in the abstract) and algorithmically manipulate them together adding nothing to the basic equation. Claims 1, 3-25, 27-30, 32-42, 44-48, 50-60, and 62-64 are, thereby, rejected under 35 U.S.C. §101.

Claim Rejections - 35 U.S.C. §112

The following is a quotation of the first paragraph of 35 U.S.C. §112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 3-25, 27-30, 32-42, 44-48, 50-60, and 62-64 are rejected under 35 U.S.C. §112, first paragraph because current case law (and accordingly, the MPEP) require such a rejection if a §101 rejection is given because when Applicant has not in fact disclosed the practical application for the invention, as a matter of law there is no way Applicant could have disclosed *how* to practice the *undisclosed* practical application. This is how the MPEP puts it:

("The how to use prong of section 112 **incorporates as a matter of law** the requirement of 35 U.S.C. 101 that the specification disclose as a matter of fact a practical utility for the invention.... If the application fails as a matter of fact to satisfy 35 U.S.C. §101, then the application also fails as a matter of law to enable one of ordinary skill in the art to use the invention under 35 U.S.C. § 112."; In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with § 112 requires a description of how to use presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a useless invention.**"). See, MPEP 2107.01(IV), quoting In re Kirk (emphasis added).

Therefore, claims 1, 3-25, 27-30, 32-42, 44-48, 50-60, and 62-64 are rejected on this basis.

Claim Rejections - 35 U.S.C. §102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 1, 19, 30, 42, and 64 are rejected under 35 U.S.C. §102(b) as being anticipated by Guha et al¹. Specifically:

Claims 1, 19, 30, 42, and 64

Claim 1, 19, 30, 42, and 64's "a first training algorithm that efficiently builds a rough model from a subset of the computer readable data set" is anticipated by Guha et al., Fig. 2, see the "Network Performance Evaluation" element.

Claim 1, 19, 30, 42, and 64's "An evaluation component that determines whether the subset of the computer readable data set is an appropriate subset to build a model for the computer readable data set; and" is anticipated by Guha et al., Fig. 2, see the "Network Performance Evaluation" and the "New, Untrained Network" elements.

Claim 1, 19, 30, 42, and 64's "A second training algorithm that builds a refined model for the computer readable data set from the subset if deemed appropriate by the evaluation component." is anticipated by Guha et al., Fig. 2, see the "Genetic Algorithm" and the "Trained Network" elements.

Response to Arguments

¹ Guha et al. (U.S. Patent Number 5,140,530; dated 18 AUG 1992; class 706; subclass 013)

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Applicant's arguments filed 05/29/2007 have been fully considered but they are not persuasive. Specifically, Applicant argues:

Argument 1

Independent claim 1 (and similarly independent claims 19, 30, 42, 44, 53, 54, 62- 64) recites a computer implemented system that facilitates building a statistical model for a computer readable data set, comprising a first training algorithm that efficiently builds" a rough statistical model from a subset of the computer readable data set capable of statistical characterization, an evaluation component that evaluates the rough statistical model to determine whether the subset of the computer readable data set is an appropriate subset to build a statistical model for the computer readable data set, a second training algorithm that builds" a refined statistical model for the computer readable data set from the subset if deemed appropriate by the evaluation component, the refined statistical model discovers good clustering of data for a fixed number of clusters and a data scheduler that, based on a data policy, adaptively controls" the size of subsets for which the first training algorithm is" applied to facilitate building a more accurate statistical model. In the subject Office Action, it is contended that a useful, concrete and tangible result is not found because the claimed invention lacks a practical application. Applicants' representative respectfully disagrees. Claim 1 (and similarly independent claims 19, 30, 42, 44, 53, 54, 62-64) recites acts that construct a refined statistical model from statistically characterizable data in a computationally economic way. The refined model enables further statistical analysis such as, inter alia, effective data clustering, statistical hypothesizing, and statistical prediction. Thus, such acts produce a useful, concrete and tangible result, namely the computationally efficient construction, from a data set, of a statistical model employable to statistical analysis of the characterized data set features.

Furthermore, in the subject Office Action, it is contended that the claimed invention merely manipulates abstract ideas. Applicants' representative avers to the contrary. The claimed subject does not manipulate abstract data but rather builds a useful statistical model from statistically characterizable data. Further, the constructed statistical model is employable to further analysis (e.g., data clustering) of the underlying population or phenomena, which the computer readable data set represents and the model characterizes.

Applicants' claimed invention produces a useful, concrete and tangible result. Accordingly, withdrawal of this rejection is requested.

Applicant claims that a statistical model is being built, but does not disclose the use of that algorithm. Accordingly, the rejections stand.

Argument 2

II. Rejection of Claims 1~ 3-25~ 27-30~ 32-42~ 44-48~ 50-60 and 62-64 Under 35 U.S.C. §112

Claims 1, 3-25, 27-30, 32-42, 44-48, 50-60 and 62-64 stand rejected under 35 U.S.C. § 112, first paragraph because current case law (and accordingly, the MPEP) require such rejection for claims that stand rejected under 35 U.S.C. § 101. This rejection should be withdrawn for at least the following reasons. As stated above, independent claims 1, 19, 30, 42, 44, 53, 54, and 62-64 have been amended to further emphasize aspects of the claimed subject matter. Accordingly, this rejection should be withdrawn.

Applicant has not overcome the 101 rejections, so the 112, first paragraph rejections are not withdrawn.

Argument 3

Applicants' claimed subject matter relates to a system and method to facilitate building a model to characterize data based on a subset of the data having an appropriate size. The claimed subject matter constructs a crude model for an initial subset of data using a first parameter estimation algorithm. The model may be evaluated, for example, by applying the model relative to a holdout data set of the data. Where the model is unacceptable, additional data can be added to the data subset and the first parameter estimation algorithm is repeated for the aggregate data subset. An appropriate subset of the data exists when the first parameter estimation algorithm produces an acceptable model. The appropriate subset of the data subsequently can be employed by a different parameter estimation algorithm to build a statistical model that more accurately characterizes the data in its entirety. The subject matter as claimed in one aspect provides a relatively fast determination of an adequate size for the training data in situations where parameters will be estimated by employing a known parameter estimation technique (e.g., an Expectation Maximization (EM) algorithm, **and the like**). To this end, independent claim 1 recites: a data scheduler that, **based on a data policy, adaptively controls the the of subsets for which the first algorithm is applied**, independent claims 19, 30, 42, and 64 recite: **utilizes a stopping criterion** that is functionally related to an expected incremental benefit and an expected incremental cost associated with increasing the s&e of the subset. Guha et al. **does not disclose or suggest these aspects of the claimed subject matter.**

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Guha does contain these. Inherently, Guha cannot operate on infinite data.

Likewise, Guha cannot operate on zero data. Therefore, a selection of a finite amount of data is inherently required.

Additionally, Guha is not an infinite loop...the system is not infinitely trained.

Therefore, a stopping criterion is inherent to the prior art.

Therefore, the rejections stand.

Argument 4

Rather, Guha et al. relates to genetic learning techniques to evolve neural network architectures for applications where a general representation of neural network architecture is linked with a genetic learning strategy creating an environment for the construction of custom neural networks. In particular, the cited document involves the use of genetic algorithm methods to design new neural networks. The genetic algorithm (GA) is a robust function optimization method used in preference to gradient descent techniques for problems fraught with local minima, discontinuity, noise, or large numbers of dimensions. However, Guha et al. does not disclose adaptively controlling the size of the subset for which the first algorithm is applied. While Guha et al. discloses utilizing a set of input-output examples referred to as the training set for supervised learning (See col. 3, 11. 10-45), Guha et al. is silent regarding adaptively controlling the size of the training set. The training set is utilized to evaluate a constructed neural network and the cited reference nowhere discloses modifying or adapting the size of the training set.

Again, Guha does contain these. Inherently, Guha cannot operate on infinite data. Likewise, Guha cannot operate on zero data. Therefore, a selection of a finite amount of data is inherently required.

Argument 5

Moreover, Guha et al. does not disclose, teach or suggest a stopping criterion that is functionally related to an expected incremental benefit and an expected incremental cost associated with increasing the size of

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the subset. Guha et al. relates to employing a genetic algorithm to create neural networks. The genetic algorithm are updated based on a fitness of a neural network. The fitness of a network is a measure of its worth on a problem, taking into account learning speed, accuracy and cost factors such as the size and complexity of the network. (See col. 2, ln. 63 to col. 3, ln. 2). While Guha et al. discloses the evaluation of neural network that weighs benefits and costs, this evaluation is employed as a comparison to other neural networks and not as a stopping criterion utilized to terminate incremental increases in the size of the subset of data. For example, the size and complexity of a neural network in Guha et al. is considered to determine a fitness of a neural network but is not altered by the fitness evaluation. A neural network that solves a problem just as well as a larger and/or more complex neural network may be deemed more fit. Still, Guha et al. is silent regarding altering the size of a neural network or making a decision to cease further size increases based upon a fitness evaluation. Thus, Guha et al. fails to disclose, teach or suggest this aspect of the claimed subject matter.

Again, Guha is not an infinite loop...the system is not infinitely trained. Therefore, a stopping criterion is inherent to the prior art.

Therefore, the rejections stand.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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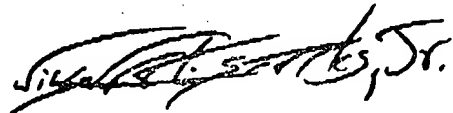
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Wilbert L. Starks, Jr. whose telephone number is (571) 272-3691.

Alternatively, inquiries may be directed to the following:

S. P. E. David Vincent (571) 272-3080

Official (FAX) (571) 273-8300

A handwritten signature in black ink, appearing to read "Wilbert L. Starks, Jr.", with a stylized, cursive script.

Wilbert L. Starks, Jr.
Primary Examiner
Art Unit 2129

WLS

06 AUG 2007